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User’s Manual For LDU8000R

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Version	Revised Content	Editor	Date
Ver1.0	First Edition	KIMI	2013-07-29
Ver1.1	Added upgrade and backup CPU Programs of LDU8000	KIMI	2013-08-30
Ver1.2	Fixed some minor bugs	KIMI	2013-10-25
Ver1.3	Added connect cable	KIMI	2013-12-31

1. Introduction of LDU8000R

LDU8000R is our latest generation of LED display controller. It can receive DVI signal (1920x1200@60Hz). After processing the DVI data, the internal VLSI（Very Large Scale Integration Circuits）of the LDU 8000 will send the processed data to the control board of the LED display through four-way Gibabit Ethernet. Specification of LDU8000 is shown in Table 1.

Table 1 specification of LDU8000R

Item	specification
Input	DVI signal Max.:1920x1200@60Hz
Output	Four RJ45 ports Each port can support up to 1920x300 pixels
Max. resolution	1920x1200
Communication	USB/ Ethernet
Power supply	input:100-240 VAC, 50-60 Hz Max. power consumption: 10W
Working Temperature	-20~60℃
Working humidity	0-95%
Dimension (LxWxD)	360x435x44.45 mm

Image 1-1　LDU8000R

2. Hardware

2.1 Control Buttons and Output Ports

The image2-1 is the interface diagram of LDU8000R

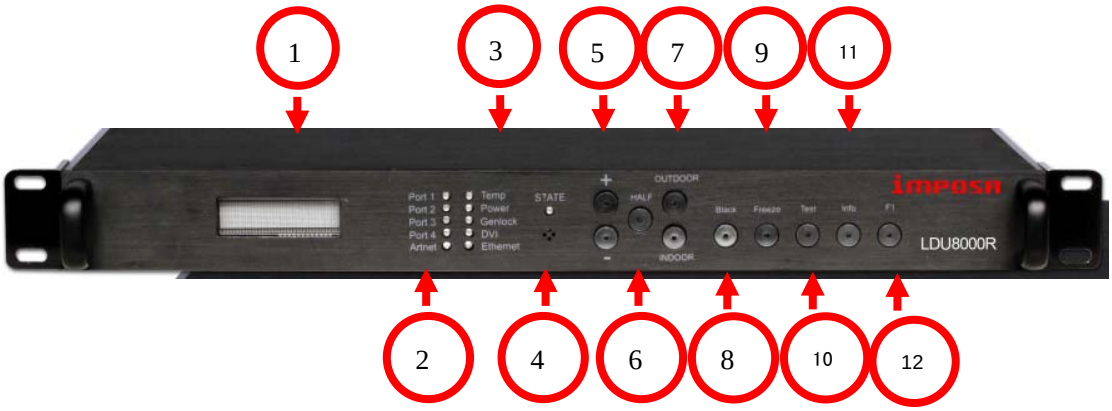


Image 2-1 LDU8000R Operation Diagram

Table 2: Description of Components

NO.	Name	Function
1	LCD Panel	Shows the real-time signal input information and the state of LDU8000R
2	Indicator Light Group 1	Prot 1： RJ45 port 1 indicator light Prot 2： RJ45 RJ45 port 1 indicator light Prot 3： RJ45 RJ45 port 1 indicator light Prot 4： RJ45 RJ45 port 1 indicator light Artnet： RJ45 RJ45 port 1 indicator light When the light turns green, it indicates that the data is coming out from the corresponding port; if no light is on or the light is red, it indicates that no data is coming out from the corresponding port or the port does not work properly.
3	Indicator Light Group 2	Temp：Temperature indicator light Power：Power indicator light Genlock：Synchronous signal indicator light DVI: DVI signal input indicator light Ethernet： Ethernet indicator light ArtNet： Artnet indicator light When the light turns green, it indicates that the data is coming out from the corresponding port; if no light is on or the light is red, it indicates that no data is coming out from the corresponding port or the port does not work properly.

4	Status Indicator Light	When the LDU800 works properly, it would be on.
5	Brightness Control Switch	+： Turn up the brightness of the display -： Turn down the brightness of the display
6	Semi-on Switch	Turn down the current brightness by 50%
7	Mode	OUT DOOR：outdoor display mode IN DOOR：indoor display mode
8	Black	Display the completely back image
9	Freeze	Freeze the image
10	Test	Shows the testing image
11	F1	Check the DVI signal information
12	F2	The button for checking the LDU8000 version; press the button for a while, the LDU8000 will automatically restart.

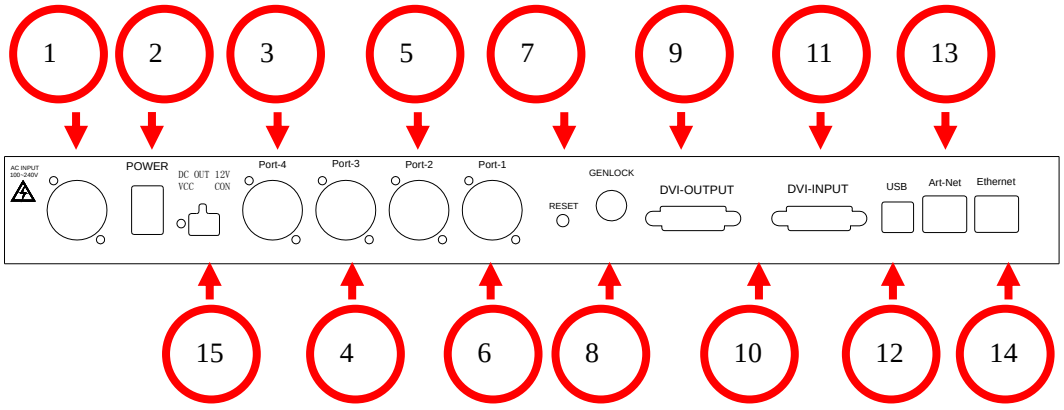


Image 2-2 Interface of LDU8000R

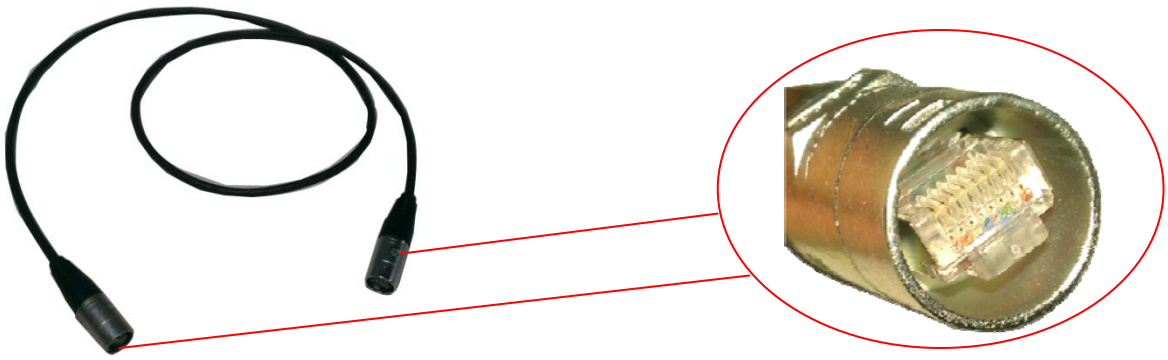
Table 3 Description of Ports

NO.	Name	Function
1	Power Port	Provide 100-240AC power supply to LDU8000R though this port
2	Power Switch	Turn on or turn off the LDU power supply Once the LDU is power on, the indicator light will be on.
3-6	RJ45 port	Gigabit Etherent signal output port, which is used for connecting the LED screen. The largest resolution can be 1920 x300. If the amber light is normally on, it indicates that the LDU and the screen keep in good connection; otherwise it means the connection is abnormal, which needs to check the signal line that connecting the LDU and the screen. If the green light is blinking, it indicates that LDU is outputting the data; otherwise it means the system works abnormally. Maybe there is no effective DVI signal being input.

7	Reset Button	Reset the IP address of LDU8000R and restart the LDU8000R
8	Genlock Port	Synchronous signal input Note: Through the BNC genlock connector, the output of LDU8000R can be synchronized to an external timing source. In turn, this source provides a periodic signal to the display system to lock the vertical refresh rate.
9	DVI output	DVI loop out, which mainly applied in multi-LDU cascade
10	System indicator light	Once the red light is blinking, it indicates that the CPU inside works properly, otherwise it means the system encounters a serious problem, and it cannot work properly. If the green light is blinking, it means that effective DVI signal is accepted.
11	DVI input	DVI signal input port. Can support signal of up to 1920x1200@60Hz
12	USB port	Not available at the moment
13	Artnet port	For network control of the LDU8000R via the internet access
14	Ethernet port	For network control of the LDU8000R via the main internet access
15	DC OUT 12V	To realize the function of remote controlling the screen, user should only connect it to the 12V control PSU in the PDU, then use our lastest version of software.

2.2 Cables

- Data cables between cabinets



- Power cables between cabinets

Power cable between cabinets and the PSU

Data cable between cabinets and LDU8000R

Network cable between the LDU8000R and PC

DVI cable

3. Application

This chapter will introduce three commonly-used work modes of LDU.

3.1 One Display Controlled By One LDU

Image 3-1 shows the structure diagram of how a LDU control a display.

LDU receives the DVI signal from computer or VPU, and sends the processed data to the LED screen after processing it.

Two random ports consist of a loop circuit in such application. In this case, if one of the ports works abnormally, it won't have an effect on the operation of the whole screen. This is of great significance on some important occasions.

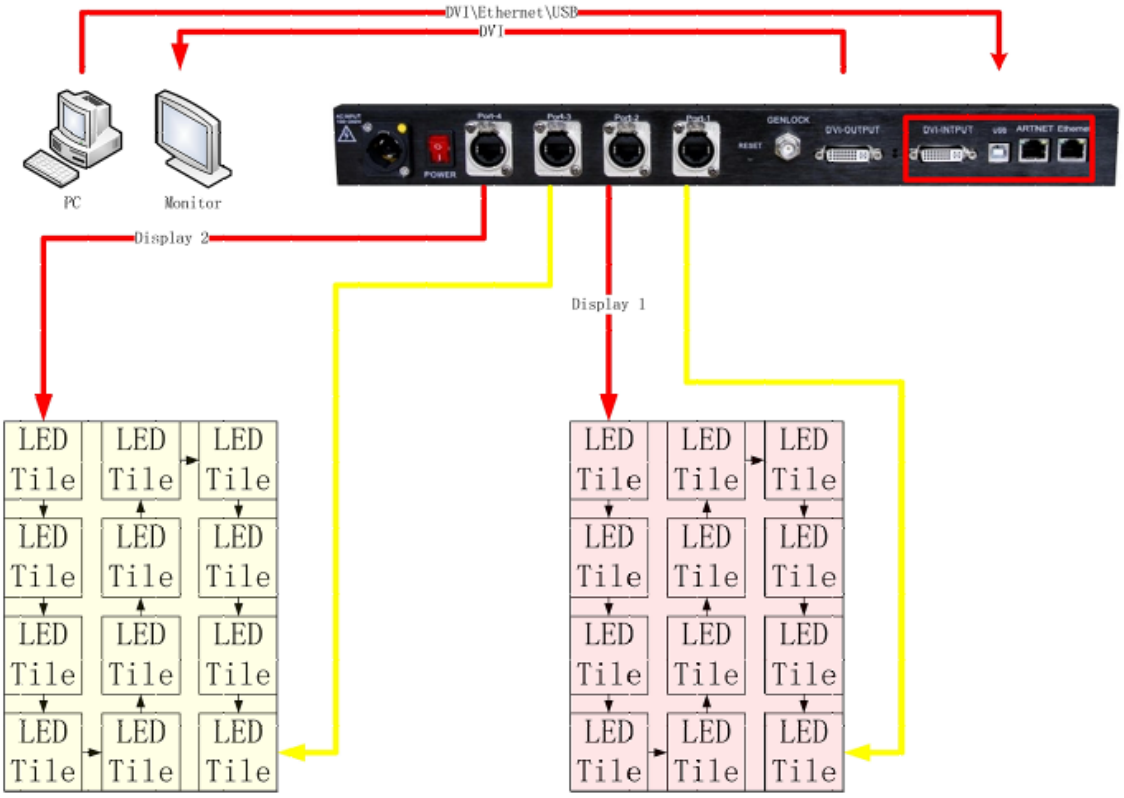


Image 3-1 Diagram of two displays controlled by one LDU

3.2 Four Displays Controlled By One LDU

Image 3-2 shows the structure diagram of how an LDU controls four displays.

In this system, there are four input /output ports of the LDU8000R respectively controlling four screens or four parts of a giant screen.

Because in this system, the signal does not shape a loop circuit, so if one of the ports works abnormally, the rest of cabinets would be affected, and they cannot work properly.

Therefore, this application is only suitable to some occasions which require lower reliability.

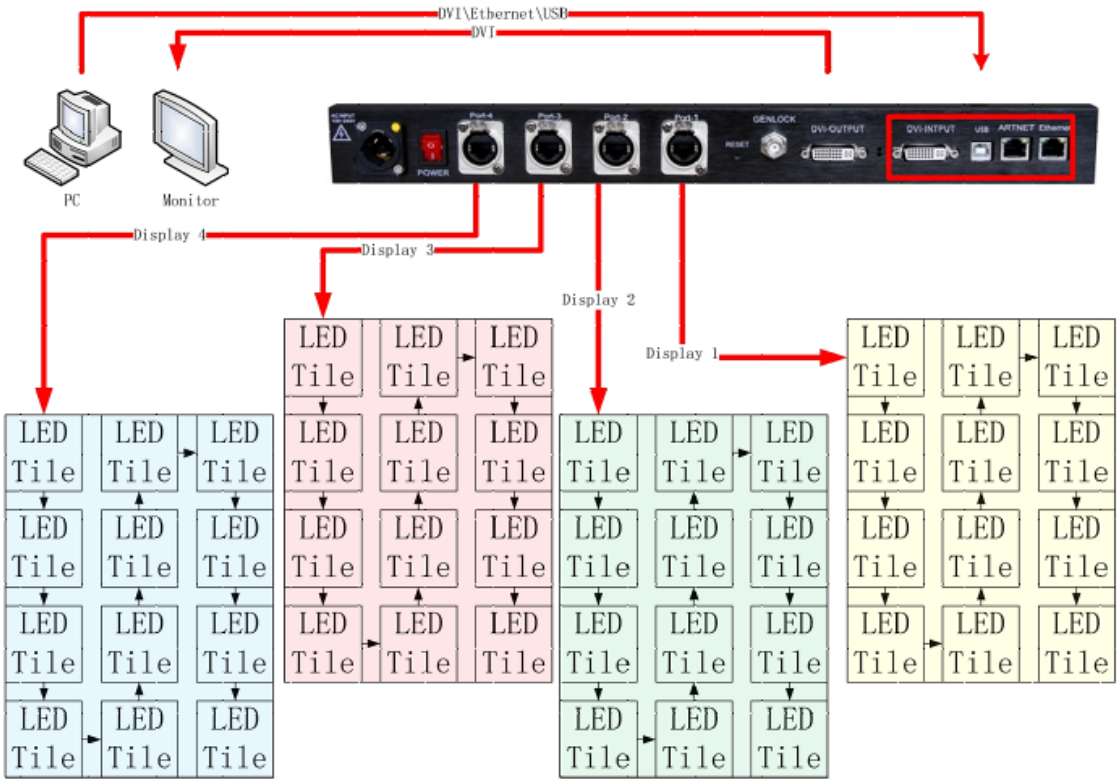


Image 3-2 Diagram of 4 displays controlled by 1 LDU

3.3 Multi-LDU Control of One Large Display

One LDU8000R can support the resolution up to 1920 X 1300(without hot backup function). For the screen which exceeds this limit, multi-LDU cascade is recommended.
The system diagram is shown in the image 5.

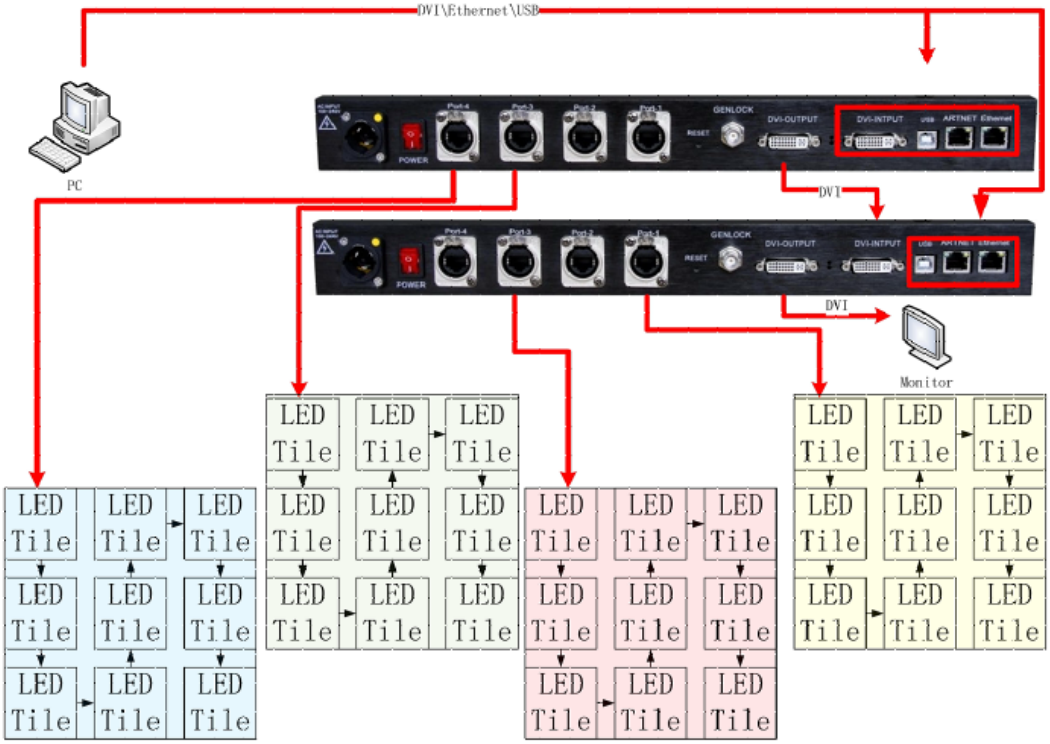


Image 3-3 Multi-LDU control of one large display

3.4 Operation Instructions for the LDU8000R

LCD panel in the control interface is mainly used for showing the running status of the LDU8000R. Normally, it shows the information below:

Ethernet 169.254.10.49

(the IP address of the Ethernet port)

Artnet 169.254.10.50

(the IP address of the Artnet port)

BRIGHT（PROT1-4） 40% 40% 40% 40%

(the current brightness of the screen)

Indicator light

Prot 1：RJ45 port 1 indicator light

Prot 2：RJ45 port 2 indicator light

Prot 3：RJ45 port 3 indicator light

Prot 4：RJ45 port 4 indicator light

Once any port connects with the cabinet, the indicator light will turn green.

When two random ports make a loop circuit (hot backup), the indicator lights of these ports will be green; And if the loop is broken, one of the cabinets will turn into back screen, but the others works properly.

Temp： Temperature indicator light

When the temperature of the cabinet keeps at a normal level, the indicator light turns green, and no information is found on the LCD panel;

Otherwise, the indicator light turns red, and corresponding information will be found on the LCD panel.

Temperature error warned as the follows:

MOD TEMP ERROR XXX Tiles

Power： Power indicator light

When the power supply works properly, the indicator light turns green, and no information is found on the LCD panel; otherwise, the indicator light turns red, and the corresponding information will be found on the LCD panel.

Power error is warned as follows

POWER ERROR XXX Tiles

Genlock：When the Genlock signal is received, the indicator light will be turned on.

DVI：When standard DVI signal is received, the indicator light will be turned on.

When the LDU8000R receives the DVI signal, the corresponding indicator light will be turned on.

Note: The LDU8000R can receive DVI signal at the same time.

Ethernet：Ethernet port indicator light

Artnet：Artnet port indicator light

When the external network connects with the Ethernet port/ Artnet port, the corresponding indicator light will turn green. If the external network connects with the Ethernet port and Artnet port at the same time, both the indicator lights will turn green.

The brightness of the screen can be adjusted by pressing the button "+" and "-". That means, if the current brightness is 50%, press the button "+", the brightness will be increased; while press the button "-", the brightness will be reduced. Each time you press the button, there will be a 5% change in the brightness, and the LCD panel will also show the current brightness.

BRIGHT（PROT1-4） 45% 45% 45% 45%

(Press the button "-" for the first time)

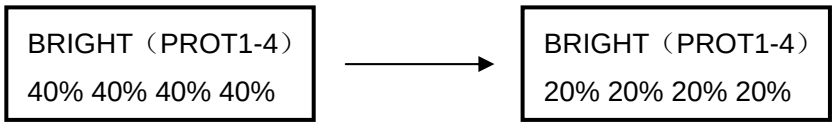
BRIGHT（PROT1-4） 50% 50% 50% 50%

(The current brightness is 50%)

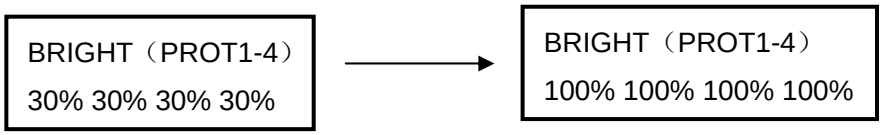
BRIGHT（PROT1-4） 55% 55% 55% 55%

(Press the button"+" for the first time)

Press the button "HALF", the brightness of the screen will be reduced by 50% no matter it is in outdoor working mode or indoor working mode. That means, when the current brightness of the screen is 40%, press the button "HALF", the brightness will reduce to only 20%, and the LCD panel will show the relative information as follows:

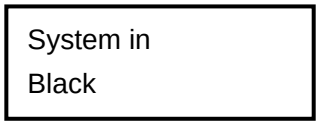


Press the button "OUT DOOR" and "IN DOOR", the display will automatically switch over to corresponding working mode, that means, there are two displaying mode, the outdoor and the indoor, the brightness of the screen will change when the working mode is changed, and the LCD panel will also show the current brightness as follows:

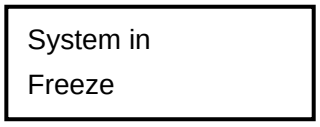


(IN DOOR mode) (OUT DOOR mode)

Press the button "BACK", the LDU8000R will change the screen into a completely black image, and the LCD panel will show the following information:

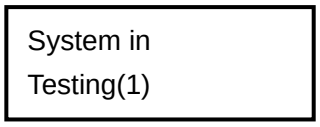


Press the button "Freeze", the current interface will be frozen , and the LCD panel will show the following information:

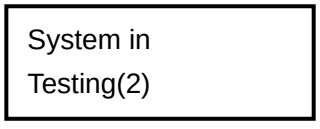


Press the button "Test", the LDU 8000 will enter the testing mode, each time you press the button, various testing mode can be chosen, 8 kind of testing signals is available in LDU8000R,; then press the button for 5 seconds, it will exit the testing mode.

For white screen, the LCD panel will display as follows



For red screen, the LCD panel will display as follows



For green screen, the LCD panel will display as follows

System in Testing(3)

For blue screen, the LCD panel will display as follows

System in Testing(4)

For horizontal scanning, the LCD panel will display as follows

System in Testing(5)

For vertical sacnning, the LCD panel will display as follows

System in Testing(6)

For grey level testing, the LCD panel will display as follows

System in Testing(7)

For TV signal testing, the LCD panel will display as follows

System in Testing(8)

Press the button "F1", LDU 8000 will show the interface that DVI signal is being input, and the LCD panel will also show the DVI signal input mode.

DVI INPUT 1920*1080@60Hz

Press the button "F2", the LCD panel will show the information about the current LDU8000R version and FPGA version.

Fw：1.01.03 FPGA：5802-320F

Press the button "F2" for 5 seconds, LDU8000R can automatically restart, and the LCD screen will show the information as follws:

System reboot ……

Reset button

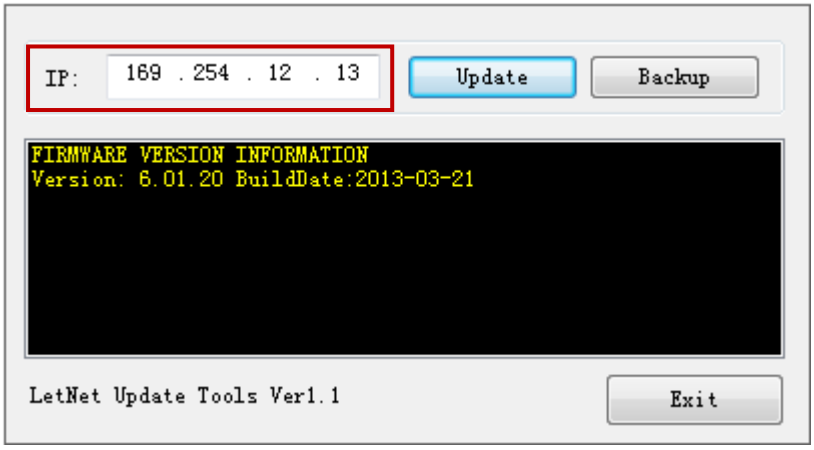
Press the button "reset" on the back of the LDU8000R, LDU8000R will restart, then the IP address of Ethernet port and the Artnet port will restore the factory settings.（Ethernet port：169.254.10.49，Artnet port：169.254.10.50）

4 Upgrade and backup CPU Programs of LDU8000R

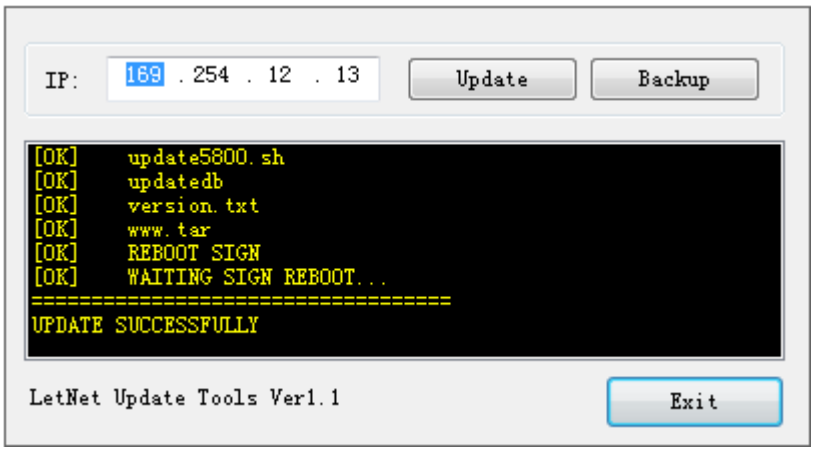
4.1 Upgrade

(1).Open firmware LetNetTools.exe.

(2) Input the LDU8000 IP address.



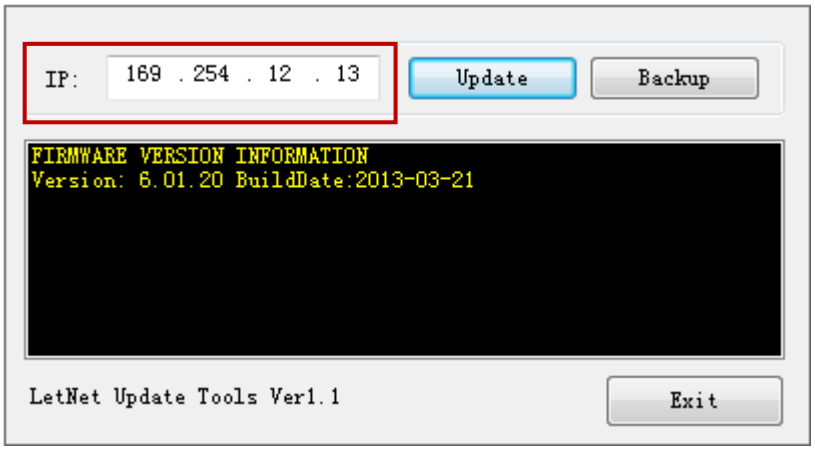
(3).Click the "Update" button to Update. If successfully, it will show "UPDATE SUCCESSFULLY". When we finished, click "Exit".



4.2 Backup

(1).Open firmware LetNetTools.exe

(2). Input the LDU8000 IP address.



(3).Click the "Backup" button to backup. backup will download all file in "backup.lst" list to backup folder .Backup successfully, it will show backup result as bellow. When we finished backup, click "Exit".